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& Rupr. Stipac. p. 57; Scribner Bot. Gat. xi. p. 171; *Stipa Richardsonii*, var. *major*, Macoun Cat. Can. Pl. iv. p. 191.

Western North America (Richardson, Borgeau), Yellowstone National Park (Tweedy), Rocky Mountains, at Morley and westward to Donald in the Columbian Valley (Macoun), Montana (Scribner No. 341).

In this species the more widely spreading panicle is 15-20 cm. long, spikelets 7-9 mm., and awn 12-20 mm. The empty glumes are acute, as is also the callus. The differential characters given by Trinius and Ruprecht, who had evidently seen Link's specimens, are as follows: *Paniculæ paucifloræ radiis inferioribus binis, divaricato-patentibus, inferne nudis, versus apicem spiculas 2-6 gerentibus*; *glumis acutis subæqualibus (superiore tantum ½ linea brevioribus), valvulam 2-3 lineam hirsutam æquantibus*; *arista subpersistente, torta, geniculata, 8-10 lineali*; *antheris barbulatis*.

The italics are as in original. The empty glumes are described as acute, and the measurements given for the parts of the spikelet apply only to the western plant.

DESCRIPTION OF PLATE CXXVII.

- A. Entire plant.
- a. Spikelet from same.
- c. The same with the empty glumes removed.
- d. Empty glumes from a spikelet of *Stipa Macounii*.
- e. Floret of same.

Reviews of Foreign Literature.

Monographie der Gattung Caltha. E. Huth. (Helios, Monat. Mittheil. Gesammptg. Naturwissenschaften, ix. 55-77; t. i.).

The author recognizes nine species, the following American: *C. sagittata*, Cav. with var. *latifolia*, *C. appendiculata*, Pers., with var. *Chilensis*, and *C. dionæifolia* from South America; *C. leptosepala*, DC., with vars. *rotundifolia* and *Howellii*, and *C. palustris*, L. with vars. *flabellifolia*, *arctica*, *parnassiiifolia*, *asarifolia* and *typica* from North America.

As to the treatment of the North American plants, *C. leptosepala*, var. *rotundifolia* is based on a specimen from Dr. Gray, collected in the Rocky Mountains and preserved in the Vienna

Herbarium; the var. *Howellii* is based on the plant distributed by Mr. Howell as *C. biflora*, DC., but Dr. Huth doubts if it is the Candollean species; it is the same as Bridges' No. 2 from California. The plant collected by the Wilkes Exploring Expedition in Washington Territory, distributed as *C. biflora*, DC. is different. *C. palustris*, var. *flabellifolia*, which is attributed to Pursh, was described by Pursh as a species, and I have maintained that it should be so regarded (Trans. N. Y. Acad. Sci. ix. 5, 6); *C. dentata*, Muhl., is quoted as a synonym of this and if they are the same is the older name. *C. palustris*, var. *arctica*, Huth (*C. arctica*, R.Br., is, according to the specimen preserved at the British Museum of Natural History, apparently *C. natans*, Pall., which species Dr. Huth does not attribute to America, although it has been found as far south as Minnesota by E. J. Hill, (BULLETIN, xvii. 99). *C. palustris*, var. *parnassifolia*, Huth (*C. parnassifolia*, Raf.) is said, following DeCandolle, to occur in New Jersey and Carolina, and var. *asarifolia*, Huth (*C. asarifolia*, DC.) to occur in Alaska, following the same author; Dr. Huth does not appear to have seen specimens of either of these.

N. L. B.

In the Botanisches Centralblatt, No. 6, of 1892, is a brief review of an article by Gregor Kraus, on calcium oxalate in the bark of trees. The author attempts to answer the question, Are the crystals of calcium oxalate in the bark of trees afterward dissolved and used in the plant economy, and therefore to be considered reserve material rather than excretory matter? To answer this question, he made exact determinations of the variation in quantity of this material at various seasons of the year.

A number of examples are given showing that the amount contained in winter was greatly diminished after the spring growth had commenced. Examples of this are twigs of *Ribes sanguineum*, which were found to have lost sixteen per cent. of the crystals from the 16th of December till the 27th of April. *Rosa canina* between the 17th of March and the 5th of May lost a little over twenty-eight per cent. *Pyrus Malus* from the 3rd of April to the 5th of May lost fifty per cent.

These experiments were not confined to one period of growth, but were repeated for several successive seasons. The author

concludes that, contrary to the usually accepted theory, these crystals are soluble in many of the plant acids.

Farther than this, he says these acids are active only when very dilute, also that the liquid in the physiologically dead crystal-tubes has the periodically changing weak acid reaction common to ordinary plant sap, therefore contains some acids and salts. This liquid, he says, cannot be considered as in a state of rest, but is subject to constant motion and change, and thus the surfaces of the crystals are exposed to a changing stream of liquid, certain at some time to hold a weak acid.

This fact in connection with the absence of protoplasmic contents in the crystal tubes, he considers very suggestive of the functions of the crystals. This difference in the quantity of crystals in winter and spring was not confined to the bark, but was found also in rhizomes and other parts from which outgrowths spring.

E. L. G.

Le Genre Meliola—Anatomie Morphologie Systematique. A. Gaillard. 163 pp. 8vo. Paris, 1892).

In this memoir one hundred and eleven species are described and one hundred and eight figured on twenty-four plates. The species are divided into two sections: first, those having ovoid or globose asci; second, those having clavate or cylindrical asci. According to the author, the short, alternate or opposite branches of the mycelium known as hyphopodia, are only undeveloped perithecia, the number of those organs actually developing into perithecia being very small in comparison with those that remain undeveloped.

The memoir is a very interesting and valuable one, and will be read with pleasure and profit by all who are interested in the beautiful genus of which it treats.

J. B. ELLIS.

Note sur un Kelloggia de la Chine. A. Franchet. (Journ. de Bot. vi. 10).

It is interesting to note the discovery in the Chinese province Yun-nan, at an altitude of 3200 m., of a *Kelloggia* that closely resembles *K. galioides*, Torrey. The habitat of the latter is in the coniferous forests of the Sierra Nevada and the mountains of Arizona, Utah, Washington and Wyoming, and the finding of

a second species demonstrates the extension into Asia of a genus hitherto considered solely American. *Kelloggia Chinensis* is another and interesting example of the simultaneous existence in North America and Central Asia of certain very characteristic plant types. Remarkable among many such cases is that of *Cypripedium arietinum*, the presence of which in the mountains of western China was most unexpected. A. M. V.

Fossil Botany, Being an Introduction to Palæophytology from the Standpoint of the Botanist. H. Graf zu Solms-Laubach. (8vo. cloth. pp. 401; illustrated. New York. Macmillan & Co. 1891. Translated into English by Henry E. F. Garnsay and revised by Isaac Bayley Balfour).

It is necessary to say in the beginning that the term "palæophytology" is used in a very restricted sense, and hence the work does not treat of the angiosperms, which are all considered as modern types of vegetation. The opening pages are largely elementary, dealing with the phenomena of petrification, formation of coal, etc. The chief value of the work will be found to consist in the grouping of supposed allied organisms, and the discussion of their probable affinities in modern vegetation and between themselves. Structural botany plays an important part in the author's conclusions, and almost the entire series of forty-nine figures is the result of microscopic analysis.

It would be impossible in a brief review to give the course of reasoning by which the author arrives at his conclusions, but it is of interest to know that original investigations and comparison of the observations of others have resulted in relegating *Oldhamia* and *Vexillum* to purely mechanical causes. In regard to *Buthotrephis* and *Spirophyton* the author still seems to be non-committal, but *Arthrophycus* is permitted to remain in the domain of the botanist. *Lepidodendron*, *Lepidophlois* and *Knorria* are given equal generic rank, and *Lepidostrobus* is referred, as might be expected, to fruiting branches of *Lepidodendra*. The *Sigillariæ* are not classed as transitional types, but are placed unequivocally with the *Archegoniata* and *Stigmaria* as the root stem of *Sigillaria*. Considerable doubt is thrown on the generally accepted ideas regarding the relations between *Calamites* and its allies, but the author is very non-committal, and we are

left practically to draw our own conclusions from the mass of testimony produced. Plants of problematic or doubtful affinity are treated in the two closing chapters, but not with the same wealth of discussion that we find in the others. In this connection may be noted *Spiraxis*, *Williamsonia*, *Spirangium*, *Sigillariopsis* and *Lyginodendron*.

No matter how our future views may be changed by the discovery of new facts, this book will always be a valuable work of reference for the botanist and palæobotanist. A. H.

Index to Recent Literature Relating to American Botany.

Abnormal Ailanthus Leaflets—A Series of. Mrs. W. A. Kellerman. (Science xix. 90, 91 ; illustrated).

Anatomy of Carices. Theo. Holm. (Bot. Gaz. xvii. 56).

Appendix to the Catalogue of the Flora of Nebraska. H. J. Webber. (Trans. Acad. Sci. St. Louis vi. 1-47 ; reprint ; Contrib. Shaw School of Botany, No. 9).

Mr. Webber, in continuing his studies of the Nebraska Flora, has found many things to add to and some corrections to make in his published catalogue of 1890. These are presented in this Appendix, which enumerates 432 species not before reported from the State, making the whole Flora, as at present known, 2322 species and varieties.

Blackberry Plant—A Seedling. Mrs. W. A. Kellerman. (Sci. xix. 94, 95 ; illustrated).

Describes the changes in leaf form in a young seedling, from the entire to the multifoliate type.

Burnt Spots on Leaves. Theo. Holm. (Bot. Gaz. xvii. 89).

Butternut—The. Geo. B. Sudworth. (Hardwood, i. No. 5).

Note on the distribution of and the durability of the woods of various species of the Juglandaceæ.

California Palms. (West. Am. Scient. viii. 13).

Note on *Washingtonia filifera* and *W. robusta*.

Cercosporæ from Alabama—Some. Geo. F. Atkinson. (Elisha Mitchell Sci. Soc. viii. 34).

Twenty-eight species of *Cercospora* are described as new.